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SUMMARY OF TRADE AND TARIFF INFORMATION

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Prepared in Terms of the Tariff Schedules of the United States

ALUMINUM

TSUS Items 618.01-644.76

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FOREWORD

Each Summary of Trade and Tariff Information is part of a series published by the United States International Trade Commission to provide information on conditions of competition between domestic and foreign products. This report, generally covering the period 1977 through 1981, is one of many being published in the current series of summaries.

This series provides information on product uses, the domestic industry, U.S. consumption, production, and trade, and the competitiveness of U.S. producers in domestic and foreign markets in each commodity area. The summaries are cast in terms of the Tariff Schedules of the United States (TSUS).

The current series will consist of approximately 250 individual reports. The Commission will issue updated statistical tables and industry status reports as appropriate for individual summaries. The overall program will run several years, ultimately covering all items of the TSUS.

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Executive Summary

This summary covers aluminum, its alloys, and their so-called basic shapes and forms as well as aluminum waste and scrap. Aluminum is a lightweight, silvery-white metal obtained from bauxite. It is important in virtually all segments of the world economy, but principal uses have been developed for it in six major industries: transportation, construction, electrical, containers and packaging, consumer durables, and mechanical equipment. Aluminum is on the critical and strategic materials list and is stockpiled by the U.S. Government. This summary excludes bauxite and alumina.

Tariff provisions and duty rates applicable to aluminum and aluminum products are found in parts 2 and 3 of schedule 6 of the Tariff Schedules of the United States. During the past 5 years, 16 worker adjustment assistance petitions were filed with the Department of Labor, all of which were denied. Aluminum and articles thereof are found in chapter 76 of the Customs Cooperation Council Nonmenclature, used by most countries except the United States and Canada. In the Canadian Tariff schedules, aluminum and alloys thereof are found in items 35301-1 to 35330-1. Certain wrought aluminum products are found in items 35415-1 to 35425-1.

The U.S. aluminum industry is composed of approximately 150 firms, operating 900 establishments, located in 40 States. The industry is highly centralized with three firms accounting for 65 percent of domestic production. The major producers are completely integrated with bauxite mining through aluminum production activities and frequently through the production of fabricated products. The industry is characterized by high capital costs, large financial resources needed for research and development, and the importance of economies of scale.

Unwrought aluminum is principally consumed by about 25,000 fabricating firms centered in the East Central United States. Wrought aluminum is generally consumed by producers of consumer and industrial products in the six major industries indicated above. Price, quality, and service are the principal factors influencing demand in most end-use markets. The quantity of unwrought aluminum and waste and scrap consumed in the United States increased in overall terms during 1977-81, although annual consumption declined near the end of the period. Imports averaged 11 percent of consumption during the period. Consumption of wrought aluminum products followed the same pattern, peaking in 1978 and then declining in 1979-81. Imports averaged 3 percent of consumption during the period.

Domestic production of unwrought aluminum and waste and scrap rose 10 percent during 1977-81. Imports of unwrought aluminum and waste and scrap rose 4 percent during 1977-81. Domestic shipments of wrought aluminum dropped 1 percent during 1977-81. Imports of wrought aluminum almost quadrupled in 1977-78, and then dropped 37 percent during 1978-81.

The international primary aluminum industry comprises six large, integrated firms with interests in 40 percent of world aluminum productive capacity; 50 private companies with interests in 25 percent of world aluminum production capacity; and 26 country governments with interests in 35 percent of world aluminum production capacity. The most important barriers to entry into the international aluminum market are a lack of access to commercial

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bauxite deposits, economies of scale, high capital costs, and proprietary technology. The United States is the world's largest producer of aluminum, followed by the U.S.S.R., Japan, and Canada. The United States is also the leading world consumer of aluminum, followed by the U.S.S.R., Japan, West Germany, France, Italy, and the United Kingdom.

Exports of unwrought aluminum and waste and scrap almost tripled during 1977-81. Exports of these items as a share of domestic production almost tripled from 3.4 percent in 1977 to 9.0 percent in 1981. Exports of wrought aluminum increased 34 percent during 1977-81. Exports of wrought aluminum as a share of domestic production rose from 4.6 percent in 1977 to 6.2 percent in 1981.

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Commodity	TSUS item No.
Unwrought aluminum:	
Of uniform cross-section throughout its length, the least cross-sectional dimension of which is not greater than 0.375 inch, in coils	618.01
Other: unalloyed	618.02
Alloyed	618.04, -.06
Aluminum waste and scrap	618.10
Wrought rods of aluminum	618.15
Angles, shapes, and sections, all the foregoing which are wrought, of aluminum	618.17
Aluminum wire	618.20, -.22
Bars, plates, sheets, and strip, all the foregoing which are wrought, of aluminum, whether or not cut, pressed, or stamped to nonrectangular shapes:	
Not clad	618.25
Clad	618.27, -.29
Aluminum powders and flakes	618.40, -.42
Pipes and tubes and blanks therefor, pipe and tube fittings, all the foregoing of aluminum	618.45, -.47, -.48
Aluminum foil (not backed and not cut to shape):	
Etched capacitor foil	644.06
Other	644.08, -.09, -.11, -.12
Aluminum foil (cut to shape but not backed)	644.26
Aluminum foil and other base metal foil except copper (backed whether or not cut to shape):	
Covered or decorated	644.38
Other	644.42
Aluminum in leaf:	
Powder or flakes	644.64, -.68
Other	644.72, -.76

Note.--For the statutory description, see excerpt from the Tariff Schedules of the United States Annotated (1982) in app. A. A concordance of the Tariff Schedules of the United States (TSUS) items included in this summary with related categories in other production, export, and import nomenclatures is found in app. B.

This summary covers unwrought aluminum, aluminum alloys (metals in which the aluminum content is, by weight, less than 99.0 percent, but not less than any other metallic element), wrought aluminum and alloys in basic shapes and forms (including foil and leaf), and aluminum waste and scrap.

Aluminum is a lightweight, silvery-white metal obtained from bauxite. It is the most abundant metallic element in the earth's crust. It is important in virtually all segments of the world economy, but principal uses have been

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developed for it in six major industries: transportation, construction, electrical, containers and packaging, consumer durables, and mechanical equipment.

Aluminum has a combination of qualities that distinguish it from other metals. It is relatively strong but lightweight, weighing only about one-tenth of a pound per cubic inch. Other desirable qualities include high workability, excellent corrosion resistance, high reflectance, and high thermal and electrical conductivity. Aluminum is nonmagnetic, making it an important property in the electrical and electronics industries. It is easily recyclable at only 5 percent of the energy needed to make aluminum from bauxite. Aluminum is also nontoxic, making it safe for use with foods and beverages. It has an attractive appearance in its natural finish, which can be soft and lustrous or bright and shiny, in virtually any color or texture.

Aluminum is marketed as: unwrought aluminum, waste and scrap, and wrought aluminum (including foil), and in the aluminum containing materials, bauxite and alumina. Bauxite and alumina, however, are excluded from this summary. Bauxite was covered in another summary 1/, and alumina (TSUS item No. 417.12), an intermediate form, is considered an inorganic chemical compound in the Tariff Schedules of the United States (TSUS).

Primary aluminum is produced by reducing bauxite to aluminum oxide (alumina), and then converting alumina to aluminum. Bauxite, the raw ore of aluminum, contains 45 to 60 percent aluminum oxide, 3 to 25 percent iron oxide, 2.5 to 18 percent silicon oxide, 2 to 5 percent titanuim oxide, up to 1 percent other impurities, and 12 to 30 percent water of crystallization. Dried, ground bauxite is mixed with a solution of caustic soda (sodium hydroxide) at elevated temperatures and pressures, which dissolves the alumina to form a sodium aluminate solution. The silica in the bauxite reacts and precipitates out of the solution, while the iron oxides and other impurities settle out.

The sodium aluminate solution is cooled until it becomes supersaturated, then seeded with previously prepared hydrated alumina crystals. Caustic soda is regenerated and the solution is then returned to be mixed with fresh bauxite slurry and sent through the cycle again.

After being washed to remove any remaining traces of impurities, concentrated aluminum hydrate crystals are roasted at temperatures of more than 2000°F. The water is driven off and the resulting alumina remains as a fine, white powder, similar to sugar in appearance and consistency.

Aluminum is produced by the electrolysis of alumina (the Hall-Heroult process). Alumina is dissolved in a bath of molten cryolite (sodium aluminum fluoride), and aluminum fluoride that are mixed together in a steel container or cell lined with carbon, then a carbon electrode (anode) is lowered into the mixture and direct electrical current is applied. The current is carried by the molten mixture to the carbon cathode lining the cell. The oxygen joins

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1/ Bauxite is included in the Summary of Trade and Tariff Information on ores and concentrates and other metal-bearing materials, USITC Publication 841, Control No. 6-1-15.

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the carbon in the anode as carbon dioxide, and the molten aluminum metal goes to the bottom of the cell where it is siphoned out periodically.

There are two classes of unwrought aluminum: primary and secondary. Primary aluminum is electrolytically reduced from alumina. Secondary aluminum is recovered from old and new scrap. Old scrap consists of aluminum recovered from worn out or discarded articles. Aluminum can recycling represents an increasing proportion of this category. New scrap consists of clippings, borings, turnings, and other forms which are generated in aluminum fabricating plants and also of rejected semifabricated and manufactured items. Approximately 75 percent of all waste and scrap (both old and new) is used in the production of unwrought aluminum by secondary smelters and about 10 percent is used by producers for blending with primary unwrought aluminum. The remainder is used primarily for direct conversion into castings and chemicals.

Unwrought aluminum can be alloyed or unalloyed. Unalloyed aluminum is produced by modern refining processes and usually emerges as 99.5 percent pure aluminum with 0.5 percent traces of other elements not removed in the refining process. Alloyed aluminum is metal in which the aluminum content, by weight, is less than 99.0 percent but more than the other metallic alloying elements, the most common of which are copper, iron, magnesium, manganese, nickel, and zinc. Unwrought alloyed and unalloyed aluminum is generally marketed in the form of ingots, although other forms often include shot, slab, and molten metal. Unwrought aluminum is used principally as a raw material in the manufacture of castings, and wrought products such as sheet, plate, bar, wire, pipe, tube, and extruded shapes.

Wrought aluminum products are made primarily by rolling, extruding, drawing, roll-forming, forging, and welding alloyed or unalloyed aluminum. These products include: sheet, plate, strip, rod, bar, wire, angles, shapes, sections, leaf, powder, flakes, pipes, tubes, blanks, and foil.

Sheet, plate, and strip are rolled products accounting for 60 percent of domestic consumption of the wrought aluminum articles in this summary. Sheet and strip are used in building and construction and in some electrical applications. Plate is used extensively in the manufacture of ships, aircraft, military vehicles, railroad cars, and tanks.

Rod and bar are solid products made by rolling or extruding. They are often used as forging stock or screw machine stock. Rod is also often drawn into wire.

Angles, shapes, and sections are solid products produced by either extruding or roll-forming flat sheet or strip into a desired shape. These products are usually architectural and structural shapes used in window and screen frames, truck-trailer flooring, aircraft wings, and automobile grilles and bumpers.

Aluminum powder is a fine, granular material produced by disintegrating a stream of molten metal with a blast of steam or air. The powder is used in powder metallurgy, pyrotechnics, and the manufacture of aluminum flakes, which are used in the production of paint.

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Seamless aluminum tubes and blanks are usually extruded to size. If close dimensional tolerances are required, the extruded tube may be drawn. Roll-formed and welded tube is produced from sheet stock. Aluminum pipes and tubes are used in irrigation systems, lawn furniture, hand railings, and as electrical conduit.

Aluminum foil is a flat-rolled product not over 0.006 inch in thickness produced from coiled aluminum sheet. It is marketed in various forms including not backed or cut to shape, cut to shape but not backed, and backed, whether or not cut to shape, covered, or decorated with characters, designs, or patterns. Aluminum in leaf, also a flat-rolled product, is a very thin sheet or plate of aluminum.

Aluminum foil is made in a variety of alloys, tempers, finishes, and coatings to meet a wide range of specifications. About 80 percent of aluminum foil consumed domestically is used in various types of packaging and wrapping. It is also used in electrical, heat transfer, and building and construction applications.

Etched capacitor foil is a specialty product manufactured by passing high purity foil through an electrochemical etching bath at a controlled rate of speed. This foil is used exclusively for producing capacitors.

There are no significant differences between domestic and imported aluminum and aluminum products.

Customs Treatment

U.S. customs treatment

Tariff provisions and duty rates applicable to aluminum and aluminum products are found in parts 2 and 3 of schedule 6 of the TSUS. The following table shows the current rates of duty which apply to imports of aluminum and aluminum products from those countries having most-favored-nation (MFN) status (col. 1) 1/, the negotiated column 1 rates of duty under the most recent Multilateral Trade Negotiations (MTN) 2/, the rates of duty which apply to imports from countries designated in the TSUS as being under Communist

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1/ The rates of duty in rate of duty column numbered 1 are most-favored-nation rates, and are applicable to imported products from all countries except those Communist countries and areas enumerated in general headnote 3(f) of the TSUS. However, such rates would not apply to products of developing countries which are granted preferential tariff treatment under the GSP or under the "LDDC" rate of duty column.

2/ The rates of duty in the negotiated rate of duty column numbered 1 are preferential rates (reflecting the full U.S. MTN concession rate for a particular item without staging of duty reductions) and are applicable to products of the least developed developing countries designated in general headnote 3(d) of the TSUS which are not granted duty-free treatment under the GSP. If no rate of duty is provided in this column for a particular item, the rate of duty provided in column numbered 1 applies. The most recent (seventh) round of multilateral trade negotiations--referred to as the Tokyo round--was held from 1973 to 1979 under the General Agreement on Tariffs and Trade.

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Aluminum: U.S. rates of duty, present and negotiated, by TSUS items

TSUS item No.	Description	Present col. 1 rate of duty 1/	Negotiated col 1. rate of duty (LDDC rate) 2/	Col. 2 rate of duty 3/	GSP eligibility
	Unwrought aluminum:				
618.01	Of uniform cross-section throughout its length, the least cross-sectional dimension of which is not greater than 0.375 inch, in coils.	3.0% ad val.	26% ad val.	18.5% ad val.	No.
	Other:				
618.02	Aluminum other than alloys of aluminum.	0.6¢ per lb	Free	11% ad val.	Yes.
	Alloys of aluminum:				
618.04	Aluminum silicon	2.4% ad val.	2.1% ad val.	25% ad val.	No.
618.06	Other	0.6¢ per lb	Free	10.5% ad val.	Yes.
618.10	Aluminum waste and scrap	2% ad val.	4/	16% ad val.	Yes.
618.15	Wrought rods of aluminum	2.8% ad val.	2.6% ad val.	11% ad val.	Yes.
618.17	Angles, shapes, and sections, all the foregoing which are wrought, of aluminum.	7.8% ad val.	5% ad val.	45% ad val.	Yes.
	Aluminum wire:				
618.20	Not coated or plated with metal	5.3% ad val.	4.2% ad val.	25% ad val.	Yes.
618.22	Coated or plated with metal	5.4% ad val.	4.2% ad val.	25% ad val.	Yes.
	Bars, plates, sheets, and strip, all the foregoing which are wrought, of aluminum, whether or not cut, pressed, or stamped to nonrectangular shapes:				
618.25	Not clad	3% ad val.	4/	13.5% ad val.	Yes.
	Clad:				
618.27	Wholly of aluminum	2.7% ad val.	4/	9.5% ad val.	Yes.
618.29	Other	9.9% ad val.	6.5% ad val.	30% ad val.	Yes.
	Aluminum powders and flakes:				
618.40	Flakes	2% ad val.	4/	11% ad val.	Yes.
618.42	Powders	8.1% ad val.	5.7% ad val.	45% ad val.	Yes.
	Pipes and tubes and blanks therefor, pipe and tube fittings, all the foregoing:				
618.45	Hollow cast extrusion ingots	1.5% ad val.	4/	15.5% ad val.	No.
618.47	Other	8.1% ad val.	5.7% ad val.	45% ad val.	Yes.
618.48	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6).	Free	5/	6/	No.
	Aluminum foil:				
	Not backed and not cut to shape:				
644.06	Etched capacitor foil	7.3% ad val.	5.3% ad val.	40% ad val.	Yes.

See footnotes at end of table.

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Aluminum: U.S. rates of duty, present and negotiated, by TSUS items--Continued

TSUS item No.	Description	Present col. 1 rate of duty 1/	Negotiated col 1. rate of duty (LDDC rate) 2/	Col. 2 rate of duty 3/	GSP eligibility
	Other:				
	Not over 0.00035 inch in thickness:				
644.08	Valued not over 55 cents per pound.	19.1% ad val.	9.8% ad val.	61.5% ad val.	Yes.
644.09	Valued over 55 cents per pound---	8.4% ad val.	5.8% ad val.	40% ad val.	Yes.
	Over 0.00035 inch in thickness:				
644.11	Valued not over 55 cents per pound.	8.4% ad val.	5.8% ad val.	47.5% ad val.	Yes.
644.12	Valued over 55 cents per pound---	7.3% ad val.	5.3% ad val.	40% ad val.	Yes.
	Cut to shape, but not backed:				
644.26	Aluminum foil----------	8.1% ad val.	5.7% ad val.	45% ad val.	Yes.
	Backed, whether or not cut to shape:				
	Covered or decorated with a character, design, fancy effect, or pattern:				
644.38	Other foil----------	4.5% ad val.	3.7% ad val.	22.5% ad val.	Yes.
	Other:				
644.42	Other foil----------	2.9% ad val.	Free	23% ad val.	Yes.
	Aluminum, in leaf:				
	Powder or flakes, in leaf:				
644.64	Leaves not over 30.25 square inches in area.	5.3% ad val.	2.7% ad val.	13.5% ad val.	Yes.
644.68	Leaves over 30.25 square inches in area.	4.7% ad val.	3.8% ad val.	104% ad val.	Yes.
	Other:				
644.72	Leaves not over 30.25 square inches in area.	1.4¢ per 100 leaves	4/	6¢ per 100 leaves	Yes.
644.76	Leaves over 30.25 square inches in area.	1.5¢ for each 3,025 sq. in.	5/	6¢ for each 3,025 sq. in.	Yes.

1/ Effective Jan. 1, 1982.
2/ Rate negotiated under the Tokyo round of the Multilateral Trade Negotiations, to be achieved through 8 annual staged reductions. This rate is currently applicable to products from countries designated as "least developed developing countries."
3/ Rate provided in the Tariff Act of 1930.
4/ Final negotiated rate is the same as the current column 1 rate.
5/ Rate not negotiated in Tokyo round of the Multilateral Trade Negotiations.
6/ Not applicable.

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domination or control (col. 2) 1/, and a reference as to the eligibility for duty-free treatment under the Generalized System of Preferences (GSP) 2/. Four Communist countries including the People's Republic of China, Poland, Romania, and Yugoslavia, are currently eligible for MFN treatment.

Aluminum waste and scrap (TSUS item 618.10) has been under continuous duty suspension through temporary legislation from March 13, 1942 to June 30, 1981 (TSUSA item 911.1220).

On March 24, 1981, the U.S. International Trade Commission and the U.S. Department of Commerce, each received a petition from the Aluminum Recycling Association, Inc., alleging that secondary aluminum alloys in unwrought form (TSUS item 618.0650) from the United Kingdom, were being, or were likely to be, sold in the United States at less than fair value. Accordingly, the Commission instituted a preliminary antidumping investigation under section 733 of the Tariff Act of 1930 (19 U.S.C. 1673b(a)) to determine whether there was a reasonable indication that an industry in the United States was materially injured, or was threatened with material injury, or the establishment of an industry in the United States was materially retarded, by reasons of the imports of such merchandise into the United States. On the basis of the record developed in investigation No. 731-TA-40 (Preliminary), the Commission unanimously made a negative determination.

During the past 5 years, the United States Department of Labor conducted 16 worker adjustment assistance investigations affecting the aluminum industry. All of these cases were denied (5 involving establishments producing primary aluminum, 4 involving establishments producing secondary aluminum, 2 involving establishments producing extruded aluminum products, and 5 involving aluminum foundries.

Foreign customs treatment

Most countries, except the United States and Canada, use the Customs Cooperation Council Nomenclature (CCCN) as the basis for their tariff classifications. 3/

Aluminum and articles thereof are found in chapter 76 of the CCCN. Heading 76.01 covers unwrought aluminum and aluminum waste and scrap. Heading 76.02 covers wrought bars, rods, angles, shapes, and sections of aluminum and aluminum wire. Heading 76.03 covers wrought plates, sheets, and strip, of aluminum. Heading 76.04 covers all aluminum foil of a thickness not exceeding

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1/ The rates of duty in rate of duty column numbered 2 apply to imported products from those Communist countries and areas enumerated in general headnote 3(f) of the TSUS.

2/ The GSP, implemented by Executive Order No. 11888 of Nov. 24, 1975, applies to merchandise imported on or after Jan. 1, 1976, and is scheduled to remain in effect until Jan. 4, 1985. The GSP provides for duty-free treatment of eligible articles imported directly from designated beneficiary developing countries.

3/ For a concordance of tariff numbers, see app. B.

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0.20 mm. Heading 76.05 covers aluminum powders and flakes. Heading 76.06 covers tubes and pipes and blanks therefor, of aluminum, and hollow bars of aluminum. Heading 76.07 covers tube and pipe fittings of aluminum. Heading 76.08 covers structures and parts of structures of aluminum, as well as plates, rods, angles, shapes, sections, and tubes of aluminum, for use in structures.

In the Canadian tariff schedules, aluminum and alloys thereof are found in items 35301-1 (pigs, ingots, blocks, notch bars, slabs, billets, blooms, and wire bars) to 35330-1 (aluminum alloy rods or wire). Certain wrought aluminum products are found in items 35415-1 (aluminum alloy wire, clad with aluminum or with aluminum alloy) to 35425-1 (nonrecorded blank lacquered aluminum or aluminum alloy recording disks).

The present rates of duty for Canada, Japan, and the EC for aluminum and aluminum products are shown in the following table.

Aluminum: Selected rates of duty, present and negotiated, in principal foreign markets for U.S. exports

Market	Description of commodity and foreign tariff item No.	Present rate of duty 1/	Negotiated rate of duty 2/
Canada	Aluminum and alloys thereof:		
	Pigs, ingots, blocks, notch bars, slabs, billets, blooms, and wire bars (35301-1).	.8¢ per pound	Free.
	Bars, rods, plates, sheets, strips, circles, squares, discs and rectangles (35302-1).	2.3% ad val.	2.1% ad val.
	Angles, channels, beams, tees, and other rolled, drawn, or extruded sections and shapes (35303-1).	11.4% ad val.	8% ad val.
	Pipes and tubes (35305-1)	11.4% ad val.	8% ad val.
	Leaf, n.o.p., or foil, less than .005. inch in thickness, plain or embossed, with or without backing (35306-1).	13.6% ad val.	9.2% ad val.
	Aluminum powder (35307-1)	13.6% ad val.	9.2% ad val.
	Aluminum leaf, less than .005 millimeter in thickness (35308-1).	Free	Free.
	Aluminum scrap (35309-1)	Free	Free.
	Granules, cut from ingots, for use in the manufacture of cleaning compounds (35310-).	1¢ per pound	9¢ per pound

See footnotes at end of table.

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Aluminum: Selected rates of duty, present and negotiated, in principal foreign markets for U.S. exports--Continued

Market	Description of commodity and foreign tariff item No.	Present rate of duty 1/	Negotiated rate of duty 2/
	Aluminum alloy sheet, not less than 0.125 inch nor more than 0.200 inch in thickness, not less than 65 inches nor more than 80 inches in width, hot rolled from aluminum alloy ingots of Canadian origin, imported for cold-rolling in Canada, for use in the manufacture of pull tab ends for beverage containers (35318-1).	Free	Free.
	Aluminum alloy lithographic sheet or strip, in the coil, for use in the manufacture of offset printing plates (35325-1).	Free	Free.
	Aluminum alloy rods or wire, single, not coated or covered, 0.375 inch and over in maximum cross-sectional dimensions, for use as master alloys, grain, refineries or hardeners in the manufacture of molten aluminum or aluminum alloy metal (35330-1).	1¢ per pound 3/	Free.
	Aluminum alloy wire, clad with aluminum or with aluminum alloy, not less than 0.360 inch nor more than 0.390 inch in diameter, for use in the manufacture of wire less than 0.25 inch in diameter (35415-1).	Free 3/	Free.
	Sheet or strip of aluminum or alloys of aluminum, lacquered, in the coil, for use in the manufacture of cans for fish products (35420-1).	12.5% ad val. 3/	Free.
	Non-recorded blank lacquered aluminum alloy recording discs for use in the manufacture of master matrices for the production of phonograph records (35425-1).	Free 3/	Free.

See footnotes at end of table.

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Aluminum: Selected rates of duty, present and negotiated, in principal foreign markets for U.S. exports--Continued

Market	Description of commodity and foreign tariff item No.	Present rate of duty 1/	Negotiated rate of duty 2/
EC----------	Unwrought aluminum; aluminum waste and scrap (76.01).		
	A. Unwrought----------	6.9% ad val.	6.0% ad val.
	B. Waste and scrap:		
	I. Waste:		
	a. Turnings, shavings, chips, milling waste,, sawdust and filings, waste of colored, coated, or bonded sheets and foil, of a thickness (excluding any backing) of 0.20mm or less.	Free	2.2% ad val.
	b. Other (including factory rejects).	3.9% ad val.	3.2% ad val.
	II. Scrap----------	Free	Free.
	Wrought bars, rods angles, shapes, and sections of aluminum wire (76.02).	11.8% ad val.	10.0% ad val.
	Wrought plates, sheets and strip of aluminum (76.03).	11.8% ad val.	10.0% ad val.
	Aluminum foil (whether or not embossed, cut to shape, perforated, coated, printed, or backed with paper or other reinforcing material), of a thickness (excluding any backing) not excluding 0.20mm (76.04).	11.8% ad val.	10.0% ad val.
	Aluminum powders and flakes (76.05):		
	A. Lamellar powders and flakes.	10% ad val.	6.3% ad val.
	B. Other----------	7.7% ad val.	5.3% ad val.
	Tubes and pipes and blanks therefor, of aluminum, hollow bars of aluminum (76.06).	11.8% ad val.	10.0% ad val.
	Tube and pipe fittings (for example, joints, elbows, sockets and flanges), of dimension (76.07).	7.9% ad val.	7.0% ad val.

See footnotes at end of table.

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Aluminum: Selected rates of duty, present and negotiated, in principal foreign markets for U.S. exports--Continued

Market	Description of commodity and foreign tariff item No.	Present rate of duty 1/	Negotiated rate of duty 2/
EC--Con.	Structures and parts of structures, of aluminum; plates, rods, angles, shapes, sections, tubes and the like, prepared for use in structures, of aluminum (76.08).	7.4% ad val.	7.0% ad val.
Japan	Unwrought aluminum, aluminum waste and scrap (76.01):		
	1. Unwrought aluminum:		
	1. Unalloyed	9% ad val.	9% ad val.
	2. Alloyed	9% ad val.	9% ad val.
	2. Waste and scrap	2.5% ad val.	Free
	Wrought bars, rods, angles, shapes, and sections of aluminum; aluminum wire (76.02):		
	1. Bars, rods, angles, shapes, and sections.	18% ad val.	11.5% ad val.
	2. Wire	12.8% ad val.	12.8% ad val.
	Wrought plates, sheets and strip, of aluminum (76.03).	18% ad val.	11.5% ad val.
	Aluminum foil (whether or not embossed, cut to shape, perforated, coated, printed, or backed with paper or other reinforcing material), of a thickness (excluding any backing) not exceeding 0.20mm (76.04).	16% ad val.	12.8% ad val.
	Aluminum powders and flakes (76.05)	10% ad val.	5.8% ad val.
	Tubes and pipes and blanks therefore, of aluminum, hollow bars of aluminum (76.06).	16% ad val.	12.8% ad val.
	Tube and pipe fittings (for example, joints, elbows, sockets and flanges), if aluminum (76.07).	10% ad val.	5.8% ad val.
	Structures and parts of structures, of aluminum; plates, rods, angles, shapes, sections, tubes and the like, prepared for use in structures, of aluminum (76.08).	10% ad val.	5.1% ad val.

1/ Rates currently applicable to imports from the United States.
2/ Final rates negotiated under the Multilateral Trade Negotiations.
3/ Temporary tariff items due to expire June 30, 1981.

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The U.S. Industry

Basic data and information

The U.S. aluminum industry, which includes ingot and mill product producers, is composed of approximately 150 firms, operating 900 establishments. This represents a long process of evolution from one domestic producer up until 1940, through small, localized operations to a complex, international industry. The number of plants producing the various aluminum products have increased substantially since World War II. The number of firms and establishments engaged in producing various aluminum products is shown on the following table.

U.S. Aluminum Industry Producers, 1978

Product	Firms	Establishments
Primary ingots	12	32
Secondary ingots	69	89
Sheet and plate	29	49
Foil	18	27
Rod and bar, rolled and continuous cast	16	31
Bare wire, conductor and nonconductor	59	125
ACSR and aluminum bare cable	28	59
Insulated or covered wire and cable	41	90
Extruded products	149	222
Drawn tube	18	22
Welded tube	25	32
Powder	13	18
Forgings	64	74
Impacts	25	29

Source: Aluminum Association.

Note.--Some of the approximately 150 firms produce a number of different products.

These plants are located in 40 States across the country, with the primary producing areas being the North Atlantic, Middle Atlantic, Southern, Midwestern, and Far Western regions. The industry is highly centralized, with three firms accounting for 65 percent of total domestic production. The major aluminum producers are completely integrated with bauxite mining through aluminum production activities and frequently through the production of fabricated products.

In 1981, the domestic aluminum industry shipped 13.9 billion pounds of various aluminum products, valued at $20.2 billion, representing 18.1 percent

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of total primary metals industry 1/ shipments, valued at $111.4 billion. This required a workforce of 147,000 persons, or 17.3 percent of the total employment in the primary metals industry (849,500 persons). Of this workforce, aluminum production workers consisted of 116,000 persons, or 17.3 percent of total production workers in the primary metals industry (669,600 workers).

Economic highlights in the aluminum industry for the past 5 years are shown in the following table.

Aluminum: Economic highlights of the U.S. aluminum industry 1977-81

Item	1977	1978	1979	1980	1981
Quantity shipped-----million pounds--	12,986	14,425	14,867	14,199	13,915
Value of product shipments-------million dollars--	13,116	15,868	18,881	19,880	20,177
Value added:					
Primary aluminum--million dollars--	1,939	1,963	2,835	2,877	1/
Mills and foundries----------do----	3,425	4,399	5,102	5,179	1/
Value added per production worker-hour:					
Primary Aluminum----------	$43.52	$40.24	$57.48	$57.49	1/
Mills and foundries----------	$18.30	$20.84	$22.92	$26.15	1/
Total employment------1,000 workers--	143	153	160	155	147
Production workers----------do----	117	124	130	124	116
Primary aluminum----------do----	23	24	25	24	23
Mills and foundries--------do----	94	100	105	100	93
Average hourly earnings:					
Primary aluminum----------	$9.37	$10.21	$11.68	$12.62	$14.29
Mills----------	$9.49	$10.68	$11.54	$13.27	$15.38
Foundries----------	$6.15	$6.79	$7.03	$7.81	$8.74
Capital expenditures:					
Primary aluminum--million dollars--	159	170	216	1/	1/
Mills and foundries----------do----	343	470	614	1/	1/

1/ Not available.

Sources: Bureau of the Census, Bureau of Labor Statistics, and Bureau of Industrial Economics estimates.

The aluminum industry is characterized by high capital costs, large financial resources needed for research and development, and the importance of economies of scale. Investment costs depend on the type of process used, the geography of the region, and the availability of transportation and power

1/ Figures for the primary metals industry include the following principal metal sectors which represent over 70 percent of all metals industries: steel, ferrous castings, aluminum, copper, lead, and zinc.

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facilities. The average capital requirement per ton for proposed new reduction plants in the United States is about $1,730. The corresponding figure for expansion of existing plants is slightly less.

Aluminum is produced by electrolysis, using the Hall-Heroult process which was developed in 1886. Current research in aluminum technology centers on improving the energy efficiency of the Hall-Heroult process.

The aluminum industry utilizes a wide variety of talents and skills in its labor force. The production and processing departments utilize mechanical engineers, scientists, metallurgists, chemists, process engineers, industrial designers, product engineers, electrical engineers, mill production workers, and laboratory technicians.

In 1981, the average hourly earnings for these employees was $14.29 in primary aluminum reduction plants, $15.38 at aluminum mills, and $8.74 at aluminum foundries. This compares with average hourly earnings for primary metals industry employees of $12.11. Other positions of importance in the aluminum industry include the general office staff, sales department, and various specialists such as legal counsels, architects, and personnel managers.

Financial information

Revenues of the three largest domestic aluminum producers, accounting for 65 percent of domestic production, rose 47 percent during 1977-80, from $8.1 billion to $12.3 billion, compared with sales for the primary metals industry, which rose 51 percent during the same period, from $83.1 billion in 1977 to $124.0 billion in 1980. Profits after taxes for the three largest domestic aluminum producers more than doubled during 1977-80, from $394 million to $898 million. Profits for the primary metals industry, however, tripled during 1977-80, rising from $1.7 billion in 1977 to $5.1 billion in 1980.

The ratio of profits after taxes to revenues for the three largest domestic aluminum producers rose from 4.9 percent in 1977 to 7.3 percent in 1980. This compares with profits as a percent of sales for the primary metals industry rising from 2.1 percent in 1977 to 4.1 percent in 1980. The ratio of profit after taxes to net worth for the three largest domestic aluminum producers rose from 11.1 percent in 1977 to 16.9 percent in 1980. This compares with profit as a percent of stockholders' equity for the primary metals industry, increasing from 4.7 percent in 1977 to 11.3 percent in 1980.

Financial data for the three largest domestic aluminum producers are shown in the following table.

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Financial revenues for the 3 largest domestic producers of aluminum, 1977-80, January-June 1980, and January-June 1981

Item	1977	1978	1979	1980	January-June--	
					1980	1981
Revenue--million dollars--	8,060	9,488	11,239	12,294	6,355	6,234
Profits after taxes million dollars--	394	576	914	888	588	395
Ratio of profit after taxes to revenues percent--	4.9	6.1	8.1	7.3	8.8	6.4
Ratio of profit after taxes to net worth percent--	11.1	14.6	20.0	16.9	1/	1/

1/ Not available.

Source: U.S. Industrial Outlook, 1982.

Prices

About 80 percent of primary aluminum production goes from the primary producer to a subsidiary producing fabricated products; however, significant quantities are sold to nonintegrated fabricators. The major aluminum producers post a list price for their product, which is changed once or twice a year. This price is determined by the long-run production costs, which are based on capital and operating costs. Petroleum, gas, and hydroelectricity costs are influential in determining aluminum prices since energy costs represent about one-third of aluminum production costs.

Most transaction prices are generated from the list price with a premium or discount determined by the extent of shortage or surplus prevailing in the market. During periods of surplus aluminum production, the transactions price is determined by the extent of price discounting offered by primary producers. During periods of shortage, the transaction price will rise above the list price.

Besides producer prices, there are dealer or free-market prices, which are regularly quoted in trade journals. In October 1978, aluminum trading was introduced in the London Metal Exchange (LME). The LME price quotation of aluminum is much more volatile in nature than the producer prices, reflecting short-term fluctuations in the industry and speculation in the commodity. It is used as a pricing and hedging medium.

The Metals Week U.S. market price for aluminum and the Mining Journal's free market price for aluminum are also commonly used price quotations. These price quotations are mainly used by international trading houses and small, independent producers that have no fixed pricing policy.

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The following table outlines the pricing pattern for unwrought and scrap aluminum over the past 5 years.

U.S. pricing patterns for unwrought and scrap aluminum, 1977-81

(In cents per pound)

Item	1977	1978	1979	1980	1981
Pure aluminum ingot, 99.5 percent:					
Beginning	48.0	53.0	56.5	66.3	76.0
Ending	53.0	56.5	66.3	76.0	76.0
Smelters' secondary aluminum alloys:					
Beginning	52.0	57.0	64.3	77.0	89.0
Ending	57.0	64.3	77.0	89.0	89.5
Smelters' scrap aluminum:					
Beginning	26.3	31.8	32.5	43.0	34.5
Ending	31.8	32.5	43.0	34.5	29.0

Source: U.S. Bureau of Mines, Minerals Yearbook 1977-81 (average prices).

Marketing

Most major domestic manufacturers are vertically integrated, producing everything from ingots to foil to manufactured items, often through subsidiaries and associated companies. They are frequently their own largest customers. As such, most transactions represent inventory changes between continuously operating reduction plants and captive fabricating units which operate on a consignment basis with customers.

Recent trends have favored the establishment and growth of aluminum reduction plants completely devoid of any marketing or equity association with the major domestic aluminum companies. The bulk of free-market activity is concerned with the trading of metal by small producers that have no fixed pricing policy and limited marketing arrangements. They sell to merchants, normally members of trading houses with no financial connection to producers, at the best possible price. In times of shortage they have the advantage in that they are able to obtain higher sales prices than the major producers that abide by official price policies. The prices recorded for these transactions give the best guide to market trends.

Most fabricators maintain their own sales departments which are staffed with sales engineers, field engineers, advertising specialists, and marketing research specialists and analysts. Most often, these individuals have technical experience in special fields such as food merchandising, automobile manufacturing, aeronautics and space technology, marine architecture, railroading, construction, household appliances, chemical processing, petroleum production, electronics, communications, instrumentation, agricultural science, and economics. They are thus able to show potential users how to handle the products most profitably for their particular purposes.

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The U.S. Market

Domestic market profile

Unwrought aluminum is principally consumed by approximately 25,000 fabricating firms which are centered in the East North Central United States. The remainder is consumed by various industrial customers who produce aluminum products. Wrought aluminum is generally consumed by producers of consumer and industrial products in six specified markets. Information concerning consumption of aluminum products by principal markets in 1981 is as follows:

Market	Percent of Consumption
Packaging and containers	30
Building and construction	21
Transportation	18
Electrical	10
Consumer durables	8
Other uses	13
Total	100

Price, quality, and service are the principal factors influencing demand in most end-use markets. Aluminum's diverse characteristics are also a significant factor in the markets where aluminum products compete with other materials. Steel, plastics, glass, and paper compete with aluminum in the container market. Steel and plastics compete with aluminum for automotive applications, since steel may be used in place of aluminum in many applications where weight saving is not important. Magnesium, titanium, and plastics compete with aluminum for aerospace applications. Magnesium and titanium may be substituted for aluminum for many structural uses in transportation equipment, but usually at higher costs. Steel, composites, and wood compete with aluminum in the building and construction market. Copper can be used in place of aluminum in many applications. Aluminum products also compete with other products made of iron, zinc, tin, and lead.

The principal competitors in the sale of primary unwrought aluminum are 12 domestic companies, 1 Canadian company, and other foreign companies. A few of the above mentioned companies and other independent companies produce reclaimed aluminum sold as unwrought secondary aluminum. Competition for the sale of wrought aluminum products is between producers of primary and reclaimed aluminum that are also engaged in fabrication, and many other fabricators of aluminum and other metal products. The markets for most extruded, rolled and drawn products are highly price competitive.

Domestic firms are competitively strong due to their possession of the following: diversified raw materials resources, a strong energy position, extensive plant facilities, capital for growth in important markets, capable personnel, and extensive research and development activities to help control product costs and aid in the development of new products and production techniques.

U.S. consumption

Apparent consumption of unwrought aluminum and waste and scrap increased in overall terms during 1977-81, however there was a gradual decline in

absolute terms near the end of the period (table 1, app. C). Apparent consumption increased during 1977-78, from 2.7 billion pounds, valued at $5.2 billion, in 1977, to 13.3 billion pounds, valued at $5.7 billion, in 1978. After 1978, apparent consumption declined annually to 12.0 billion pounds, valued at $6.6 billion, in 1980. In 1981, apparent consumption rose to slightly above 1978 levels at 13.4 billion pounds, valued at $7.8 billion. During 1977-81, domestic production accounted for about 89 percent of apparent consumption and imports averaged 11 percent of apparent consumption. In 1980, the United States became a net exporter of aluminum as imports declined due to the economic downturn and exports to Japan and Western Europe rose due to production difficulties there. Imports amounted to 11.8 percent of apparent consumption in 1981. The United States again became a net importer of aluminum in 1981, due to declining production coupled with increased consumption, and a sharp decline in exports of ingot and scrap, caused by weakening markets.

Apparent consumption of wrought aluminum products, including foil, followed the same general pattern as shown in apparent consumption of unwrought aluminum and waste and scrap (table 1, app. C), although declining in overall terms during 1977-81 (table 2, app. C). Apparent consumption increased during 1977-78, from 10.1 billion pounds in 1977 to 11.4 billion pounds in 1978, and then declined annually to 10.0 billion pounds in 1981. During 1977-81, except in 1978, the U.S. was a net exporter of aluminum mill products. Imports averaged 2.9 percent of apparent consumption during the period, and amounted to 3.1 percent of apparent consumption in 1981.

Consumption of aluminum mill products by all major market segments declined except for the containers and packaging segment. Beverage cans comprised about two-thirds of the aluminum containers and packaging market, which also included consumer foil, flexible packaging, semirigid food containers, and other products. Aluminum's share of the beverage can market, by far the fastest growing use of aluminum in the 1970's, continued to increase in the 1980s. Consumption by the transportation industry showed the largest decline among the major aluminum markets in 1980-81, reflecting the weakness in domestic passenger car sales. The estimated average consumption of aluminum in domestic automobiles, however, has risen from 87 pounds per unit in 1977 models to about 130 pounds per unit in 1981 models. The markets for hard alloy extrusions have also been growing.

U.S. production

Despite continuing problems of power availability and lower domestic demand, production of aluminum throughout 1977-80 was maintained at or near record levels. The reduced domestic demand was partially offset by strong markets abroad, due to production difficulties there, that enabled domestic producers to increase exports and maintain production. Weakening markets, however, forced a decline in domestic production during 1981.

Domestic production of unwrought aluminum and waste and scrap increased annually during 1977-80, rising from 11.6 billion pounds in 1977 to 13.0 billion pounds in 1980 (table 1, app. C). Domestic production in 1981 totaled 13.0 billion pounds. This includes an increase in primary production

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from 9.1 billion pounds in 1977 to 9.9 billion pounds in 1981 and an increase in secondary recovery from 2.5 billion pounds in 1977 to 3.1 billion pounds in 1981. The value of primary production also increased annually during the 1977-81 period from $4.7 billion in 1977 to $7.5 billion in 1981 or from $0.52 per pound in 1977 to $0.76 per pound in 1981.

In 1980-81, production of secondary aluminum alloys declined significantly from 1977-79 levels because of decreased demand from motor-vehicle manufacturers. The maintenance of secondary aluminum recovery at levels near those of 1977-79 was, however, largely a reflection of a continued strong growth in the recycling of aluminum cans.

Domestic shipments of wrought aluminum, including foil, increased from 10.4 billion pounds in 1977 to 11.3 billion pounds in 1978, and then declined annually to 10.3 billion pounds in 1981 (table 2, app. C). The following table identifies the eight product groups, by quantity and percentage distribution, of aluminum mill product shipments in 1977 and 1981.

Aluminum: U.S. net shipments, by product groups, 1977 and 1981

Product Group	Quantity		Percentage distribution of total mill products	
	1977	1981	1977	1981
	--Million pounds--			
Sheet and plate	6,040.4	5,962.5	57.8	57.8
Foil	805.6	858.1	7.9	8.3
Extruded products and drawn tube	2,281.5	2,089.2	21.8	20.2
Bar, rod, and wire	230.9	335.4	2.2	3.2
Electrical conductor	727.7	708.6	7.0	6.9
Forging and impacts	121.3	139.5	1.2	1.4
Welded tube	114.5	119.8	1.1	1.2
Powder and paste	121.1	107.9	1.2	1.0
Total mill products	10,443.0	10,321.0	100.0	100.0

Source: Aluminum Statistical Preview 1981, Aluminum Association.

Annual demand for aluminum mill products fell in 1979 and 1980. The reduced domestic demand was partially offset by strong markets abroad that enabled producers to increase exports. Weakening markets, however, forced a decline in exports in 1981.

Aluminum metal is on the critical and strategic materials list and is stockpiled by the U.S. Government. The status of the stockpile as of November 30, 1981, was as follows:

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Material	Goal	Total inventory	Authorized for disposal	Sales, 11 months
	1,000 short tons			
Aluminum	700	2	-	-

U.S. imports

Import trends.--Imports of unwrought aluminum and waste and scrap rose from 1.5 billion pounds, valued at $695 million, in 1977, to 1.7 billion pounds, valued at $814 million, in 1978, and then declined and stabilized at 1.3 billion pounds in 1979 and 1980, valued at $705 million and $838 million, respectively (table 3, app. C). In 1981, imports rose again to 1.6 billion pounds, valued at $1.1 billion. The 24-percent decline in imports from 1978 to 1979 marks the point at which domestic demand and consumption began to decline, resulting in surplus supply and increased exports. During this period, the United States began the shift from a net importer to a net exporter for these products. In 1981, domestic demand outstripped production returning the U.S. to a position of net importer. The unit value per pound of unwrought aluminum and waste and scrap imported increased almost one and one-half times between 1977-81, beginning at 46 cents per pound in 1977 and ending at 67 cents per pound in 1981.

Imports of unwrought aluminum and waste and scrap fell from 11.9 percent of apparent consumption in 1977 to 11.8 percent of apparent consumption in 1981 (table 3, app. C). The major import source for the United States in this product category has been Canada, which supplies about two thirds of U.S. imports. Canada is followed in import source importance by Ghana. Both countries have relatively cheap energy based on hydroelectric power costs.

Imports of wrought aluminum, including foil, almost tripled from 165.8 million pounds, valued at $125.8 million, in 1977, to 486.0 million pounds, valued at $371.7 million, in 1978. An expanding U.S. economy with strong business activity raised the demand for imports of aluminum during 1978. Imports of wrought aluminum, including foil, declined annually from 1978-80, amounting to 170.1 million pounds, valued at $197.3 million, in 1980 (table 4, app. C). Imports almost doubled in 1981 to 307.5 million pounds, valued at $357.4 million. The unit value per pound of wrought aluminum, including foil, imported almost doubled between 1977-81, rising from 76 cents per pound in 1977 to $1.16 per pound in 1981.

Imports of wrought aluminum, including foil, rose from 1.6 percent of apparent consumption in 1977 to 3.1 percent of apparent consumption in 1981. The major import sources for the United States in this product category in 1981 were Canada, Japan, Australia, Belgium, and Venezuela.

The majority of the wrought aluminum products imported were sheet and plate (75 percent), followed by rod and bar (10 percent), and powder (7 percent). According to the Aluminum Association, of the total wrought aluminum products imported in 1980, 84.7 percent went to consumers who

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fabricate the aluminum into a finished product and 15.3 percent went to domestic aluminum producers that further process these items into another mill product. 1/

Imports under item 806.30.--Imports under item 806.30 are articles of metal manufactured in the United States that are exported to be advanced in value or improved in condition by any process of manufacture and returned to the United States for further processing. A complete description can be found in the TSUS under item 806.30 (see excerpt in app. A).

Imports under item 806.30 during 1977-81 totaled 223.4 million pounds, valued at $192.6 million. These items represent three and four percent, respectively, of total aluminum imports in quantity and value during 1977-81. Over the 5 year period, the major sources of these imports have been Canada, West Germany, France, and Japan. The bulk of the items exported for advancement were aluminum ingots for rolling. About one-half of item 806.30 imports consisted of wrought sheet and strip, not clad; aluminum foil and unwrought aluminum accounted for virtually all of the remainder. The following tabulation shows the leading three import sources classified under item 806.30:

Year	Quantity (1,000 pounds)	Value (1,000 dollars)	Sources
1977------	26,460	16,924	Canada, France, Switzerland.
1978------	66,517	47,080	Canada, France, Ghana.
1979------	41,580	41,446	Canada, Japan, West Germany.
1980------	23,130	22,042	Canada, West Germany, Japan.
1981------	65,730	65,157	Canada, Italy, West Germany.

Imports under item 807.00.--Imports under item 807.00 are articles assembled abroad from fabricated components produced in the United States. These articles were exported in condition ready for assembly without further fabrication; have not lost their physical identity in such articles by change in form, shape, or otherwise; and have not been advanced in value or improved in condition abroad except by being assembled or by operations incidental to the assembly process. A complete description can be found in the TSUS under item 807.00 (see excerpt in app. A).

Imports under item 807.00 during 1977-81 totaled 2.7 million pounds, valued at $2.5 million. Over the 5-year period, the sources of these imports have been Canada, France, West Germany, Mexico, Japan, and Italy. Continuous cast sheets, reroll stock, in coils, and extruded shapes were the items exported for assembly. Item 807.00 imports consist of various wrought products. The following tabulation shows imports classified under item 807.00:

1/ Data are currently unavailable from Aluminum Association for 1981.

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Year	Quantity (1,000 pounds)	Value (1,000 dollars)	Sources
1977	81	63	Canada.
1978	329	225	France.
1979	316	244	Canada.
1980	299	280	Canada, West Germany.
1981	1,698	1,639	Canada, Mexico, Japan, Italy.

Imports under the Generalized System of Preferences.--Imports of most aluminum products have been eligible for duty-free treatment under GSP since its institution in 1976 (see duty table, U.S. customs treatment section, for individual item GSP eligibility). GSP imports of aluminum include unwrought, mill products (wire, rods, bars, plates, sheets, strip, powders, pipes, tubes, blanks, fittings, and foil), and some waste and scrap imported under the GSP in 1978.

Imports under the GSP during 1977-81 totaled 260.6 million pounds, valued at $216.2 million. These items represent three and four percent, respectively, of total aluminum imports in quantity and value during 1977-81. Over the 5-year period, the major sources of these imports have been Yugoslovia, Hong Kong, Romania, Israel, Mexico, Venezuela, Brazil, and Taiwan. The following tabulation shows the top three import sources classified under the GSP:

Year	Quantity (1,000 pounds)	Value (1,000 dollars)	Sources
1977	20,088	13,348	Yugoslavia, Hong Kong, Romania.
1978	52,819	34,954	Yugoslavia, Romania, Hong Kong.
1979	52,298	40,380	Yugoslavia, Romania, Hong Kong.
1980	16,649	17,131	Yugoslavia, Hong Kong, Brazil.
1981	118,781	110,432	Yugoslavia, Taiwan, Israel.

The International Market

International market profile

The aluminum industry is international by its very nature. From the extraction of its basic source material at bauxite sites located in a limited number of countries throughout the world 1/ to its fabrication and distribution in every nation on earth, the aluminum industry should be viewed in a world-wide perspective.

1/ See Bauxite section in the summary on Ores and Concentrates and Other Metal-Bearing Materials, USITC publication 841, control number 6-1-15, February 1982.

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The international primary aluminum industry comprises 6 large, integrated firms, which own or have equity interest in about 40 percent of world aluminum productive capacity, and about 50 other private companies, which own 25 percent of aluminum productive capacity, frequently in association with one or more of the 6 large firms. Governments of 26 countries own or have equity interests in the remaining 35 percent. Of the six large integrated firms, three are headquartered in the United States, and one each is headquartered in Canada, France, and Switzerland.

The most important barriers to entry into the international aluminum market are access to commercial bauxite deposits, economies of scale, high capital costs, and proprietary technology. The minimum efficient scale is generally considered by the industry to be about 100,000 metric tons per year for an aluminum smelter. Industrial centralization in the aluminum industry remains high, however, the growing use of scrap provides a source of metal which is not tied to vertically integrated systems.

Producer prices differ in different countries, due to limited competition and because of trade barriers. There are also dealer or free market prices, the major one being the London Metal Exchange (LME) aluminum contract for cash and 3-month contracts. This quotation is more volatile in nature than the producer prices, reflecting short-term fluctuations in the industry. Daily aluminum LME quotations are cited in most trade journals.

The United States is the world's largest producer of aluminum, followed by the U.S.S.R., Japan, and Canada. Significant capacity expansions have been completed in Australia, Canada, Egypt, France, the U.S.S.R., the United States, and Yugoslavia. Because of the large use of electrical energy for primary aluminum metal production, energy policies at the individual country level will play an increasingly important role in locating future production facilities. Of the major aluminum producing countries, only France and the U.S.S.R. produce a major portion of their ore requirements. The other principal aluminum producers, due to a lack of bauxite resources, rely mostly on imported bauxite or alumina.

The United States has long been the leading world consumer of aluminum, however, its share of world aluminum demand has decreased. The U.S.S.R., Japan, West Germany, France, Italy, and the United Kingdom, in decreasing order, were the next largest consumers.

U.S. exports

Exports of unwrought aluminum and waste and scrap increased annually from 398.9 million pounds, valued at $158.6 million, in 1977, to 2.3 billion pounds, valued at $1.6 billion, in 1980 (table 5, app. C). Exports declined in 1981 to 1.2 billion pounds, valued at $763 million. The unit value per pound of unwrought aluminum and waste and scrap exported increased more than one and one-half times between 1977-81, beginning the period at 40 cents per pound and ending the period at 65 cents per pound.

Exports of unwrought aluminum and waste and scrap almost tripled from 3.4 percent of production in 1977 to 9.0 percent of production in 1981. The

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principal export market for the United States in this product category has been Japan, which receives about half of our exports. This is due, in part, to certain production difficulties they have experienced in recent years. Japan is followed in export market importance by Mexico and Canada.

Exports of wrought aluminum, including foil, declined from 477.7 million pounds, valued at $375.2 million, in 1977, to 452.9 million pounds, valued at $408.6 million, in 1978, and then increased annually to 766.8 million pounds, valued at $885.1 million, in 1980 (table 6, app. C). In 1981, exports declined to 641.5 million pounds, valued at $745.1 million. The unit value per pound of wrought aluminum, including foil, exported rose 47 percent between 1977-81, from 79 cents per pound in 1977 to $1.16 per pound in 1981.

Exports of wrought aluminum, including foil, increased from 4.6 percent of production in 1977 to 6.2 percent of production in 1981. The principal export market for the United States in this product category has been Canada, which receives slightly more than one-third of our exports. Canada is followed in export market importance by Mexico.

The majority of the wrought aluminum products exported were sheet (50 percent) and rod and bar (20 percent).

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Glossary

Alloy.	A substance having metallic properties and being composed of two or more chemicals elements of which at least one is an elemental metal.
Drawing.	Forming recessed parts by forcing the plastic flow of metal in dies.
Electrolysis.	Chemical change resulting from the passage of an electric current through an electrolyte.
Extrusion.	The operation of producing rods, tubes, and various solid and hollow sections, by forcing heated metal through a suitable die by means of a ram.
Forge.	To form by heating in an open fireplace or hearth with force draft and hammering; to beat into some particular shape.
Mill.	A single machine or a complete plant for rolling metals.
Reduction plant.	A mill or a treatment place for the extraction of values from ore, such as a smelter.
Rolling.	Reducing the cross-sectional area of metal stock or otherwise shaping metal products (sheets, bars, rails, rods) through the use of rotating rolls.
Unwrought.	Metals which have not been machine worked.
Welding.	The joining of two metal surfaces which have been heated sufficiently to melt and fuse them together
Wrought.	The type of metals that are suitable for forming by mechanical means at temperatures below the melting point. Wrought metals are used for rolling, drawing, extruding, and forging operations.

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Appendix A

Part 2, Subpart D, Schedule 6 and Part 3, Subpart C, Schedule 6, of the Tariff Schedules of the United States Annotated (1982) and Staged Rates of Duty

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C S P	Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	LDDC	2
			Subpart D. - Aluminum				
			Subpart D headnotes:				
			1. This subpart covers aluminum, its alloys, and their so-called basic shapes and forms and also covers aluminum waste and scrap.				
			2. Alloys of aluminum: For the purposes of the tariff schedules, alloys of aluminum are metals in which the aluminum content is, by weight, less than 99.0 percent, but not less than any other metallic element. Aluminum silicon is an alloy of aluminum containing not less than 25 percent of silicon. In the absence of context which requires otherwise, the term "aluminum", wherever used in the tariff schedules, includes alloys of aluminum.				
			3. For the purposes of this subpart, the following terms have the meanings indicated: (a) Bars: Products of solid rectangular cross section, 0.25 inch or more in thickness and over 0.375 inch but not over 12 inches in width, in coils or cut to length; and products of solid hexagonal or octagonal cross section, 0.375 inch or more in thickness (measuring the perpendicular distance between opposite faces) in coils, or of any thickness in straight lengths. (b) Rods: Products of solid round cross section, which, if 0.375 inch or more in diameter, are in coils or cut to length, and which, if under 0.375 inch in diameter, are in straight lengths. (c) Plates, sheets, and strips: Products of solid rectangular cross section, in coils or cut to length, whether or not corrugated or crimped. Plates are 0.25 inch or more in thickness and over 12 inches in width; sheets and strip are under 0.25 but not under 0.006 inch in thickness. (d) Wire: A product of solid round, rectangular, hexagonal, or octagonal cross section, in coils, whose diameter, width, or perpendicular distance between opposite faces is less than 0.375 inch. (e) Angles, shapes, and sections: Products which do not conform completely to the respective definitions set forth in this headnote for bars, plates, sheets, strips, rods, or wire and do not include any tubular products.				
			Subpart D statistical headnote:				
			1. For purposes of this subpart, the term "beryllium aluminum master alloy" refers to an alloy of aluminum which contains not less than 4 percent of beryllium.				

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GSP	Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty LDDC	Rates of Duty 2
			Unwrought aluminum:				
	618.01	00	Of uniform cross-section throughout its length, the least cross-sectional dimension of which is not greater than 0.375 inch, in coils	Lb.	3% ad val.	2.6% ad val.	18.5% ad val.
			Other:				
A	618.02	00	Aluminum other than alloys of aluminum	Lb.	0.6c per lb.	Free	11% ad val.
			Alloys of aluminum:				
	618.04	00	Aluminum silicon	Lb.	2.4% ad val.	2.1% ad val.	25% ad val.
A	618.06		Other		0.6c per lb.	Free	10.5% ad val.
		10	Beryllium aluminum master alloy	Lb.			
			Other:				
		30	Of uniform circular cross-section throughout its length, not in coils	Lb.			
		50	Other	Lb.			
A	618.10	00	Aluminum waste and scrap	Lb.	2% ad val.		16% ad val.
A	618.15		Wrought rods of aluminum		2.8% ad val.	2.6% ad val.	11% ad val.
		20	Under 0.375 inch in diameter	Lb.			
		40	0.375 inch or more in diameter	Lb.			
A	618.17	00	Angles, shapes, and sections, all the foregoing which are wrought, of aluminum	Lb.	7.8% ad val.	5% ad val.	45% ad val.
			Aluminum wire:				
A	618.20	00	Not coated or plated with metal	Lb.	5.3% ad val.	4.2% ad val.	25% ad val.
A	618.22	00	Coated or plated with metal	Lb.	5.4% ad val.	4.2% ad val.	25% ad val.
			Bars, plates, sheets, and strip, all the foregoing which are wrought, of aluminum, whether or not cut, pressed, or stamped to nonrectangular shapes:				
A	618.25		Not clad		3% ad val.	2	13.5% ad val.
		20	Circles and discs	Lb.			
		40	Bars	Lb.			
		50	Plates	Lb.			
		65	Sheets and strip	Lb.			
		80	Other	Lb.			
			Clad:				
A	618.27		Wholly of aluminum		2.7% ad val.		9.5% ad val.
		20	Circles and discs	Lb.			
		65	Other	Lb.			
A	618.29	00	Other	Lb.	9.9% ad val.	6.5% ad val.	30% ad val.
			Aluminum powders and flakes:				
A	618.40	00	Flakes	Lb.	2% ad val.		11% ad val.
A	618.42	00	Powders	Lb.	8.1% ad val.	5.7% ad val.	45% ad val.
			Pipes and tubes and blanks therefor, pipe and tube fittings, all the foregoing of aluminum:				
	618.45	00	Hollow cast extrusion ingots	Lb.	1.5% ad val.		15.5% ad val.
A	618.47	00	Other	Lb.	8.1% ad val.	5.7% ad val.	45% ad val.
	618.48	00	If Canadian article and original motor-vehicle equipment (see headnote 2, part 6B, schedule 6)	Lb.	Free		

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

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GSP	Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty LDDC	Rates of Duty 2
			Bale ties, of iron or steel, with or without buckles or fastenings and whether or not coated with paint or other substance:				
			Made from wire:				
	642.90	00	Single loop ties made of round wire over 0.055 but not over 0.082 inch in diameter, and 7.5 or more but not over 10.5 feet in length	Lb.	Free		Free
	642.91	00	Other	Lb.	8.1% ad val.	5.7% ad val.	45% ad val.
A	642.93	00	Made from strip	Lb.	0.02c per lb.		0.25c per lb.
			Milliners' wire and other wire covered with textile or other material not wholly of metal:				
	642.96	00	Galvanized wire wholly of round iron or steel wire measuring not over 0.20 inch and not under 0.075 inch in diameter, if covered with plastics	Lb.	0.9% ad val.		2% ad val.
	642.97	00	Other	Lb.	8% ad val.	5.3% ad val.	35% ad val.
			Subpart C. - Metal Leaf and Foil; Metallics				
			Subpart C statistical headnote:				
			1. For the purposes of this subpart, the term "beryllium copper" refers to an alloy of copper as defined by the Tariff Schedules which contains by weight not less than 0.02 percent but less than 3 percent of beryllium with or without small quantities of other elements.				
			Base metal foil (whether or not embossed, cut to shape, perforated, etched, coated, printed, colored, decorated, or backed with paper or equivalent backing) not over 0.006 inch in thickness (excluding any coating or backing):				
			Not backed and not cut to shape:				
A	644.02		Copper foil		1.5% ad val.	1% ad val.	6.5% ad val.
		10	Alloyed:				
		30	Beryllium copper	Lb.			
		40	Other	Lb.			
			Other	Lb.			
			Aluminum foil:				
A	644.06	00	Etched capacitor foil	Lb.	7.3% ad val.	5.3% ad val.	40% ad val.
			Other:				
			Not over 0.00035 inch in thickness:				
A	644.08	00	Valued not over 55 cents per pound	Lb.	19.1% ad val.	9.8% ad val.	61.5% ad val.
A	644.09	00	Valued over 55 cents per pound	Lb.	8.4% ad val.	5.8% ad val.	40% ad val.
			Over 0.00035 inch in thickness:				
A	644.11	00	Valued not over 55 cents per pound	Lb.	8.4% ad val.	5.8% ad val.	47.5% ad val.
A	644.12	00	Valued over 55 cents per pound	Lb.	7.3% ad val.	5.3% ad val.	40% ad val.

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

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TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED (1982)

SCHEDULE 6. - METALS AND METAL PRODUCTS
Part 3. - Metal Products

GSP	Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty		
					1	LDDC	2
			Base metal foil (whether or not embossed, cut to shape, perforated, etched, etc.) (con.):				
			Not backed and not cut to shape (con.):				
A	644.15	00	Tin foil	Lb.	13.6% ad val.	7% ad val.	35% ad val.
			Lead foil:				
A	644.17	00	Valued not over 13-1/3 cents per pound	Lb.	6.1% ad val.	4.7% ad val.	28% ad val.
A	644.18	00	Valued over 13-1/3 cents per pound	Lb.	4.9% ad val.	3.9% ad val.	45% ad val.
A	644.20	00	Zinc foil	Lb.	7.4% ad val.	3.8% ad val.	45% ad val.
A	644.22	00	Other foil	Lb.	7% ad val.	3.6% ad val.	45% ad val.
			Cut to shape, but not backed:				
A	644.24	00	Copper foil	Lb.	8.8% ad val.	6% ad val.	47% ad val.
A	644.26	00	Aluminum foil	Lb.	8.1% ad val.	5.7% ad val.	45% ad val.
A	644.28	00	Lead foil	Lb.	4.3% ad val.	2.2% ad val.	45% ad val.
A	644.30	00	Zinc foil	Lb.	8.1% ad val.	5.7% ad val.	45% ad val.
A	644.32	00	Other foil	Lb.	7.7% ad val.	5.5% ad val.	45% ad val.
			Backed, whether or not cut to shape:				
			Covered or decorated with a character, design, fancy effect, or pattern:				
A	644.36	00	Copper foil	Lb.	4% ad val.	3.3% ad val.	21% ad val.
A	644.38	00	Other foil	Lb.	4.5% ad val.	3.7% ad val.	22.5% ad val.
			Other:				
A	644.40	00	Copper foil	Lb.	3.1% ad val.	Free	24.5% ad val.
A	644.42	00	Other foil	Lb.	2.9% ad val.	Free	23% ad val.
			Precious metal leaf, whether unmounted or mounted on paper or equivalent backing:				
			Gold leaf:				
			Unmounted:				
A	644.46	00	Leaves not over 11.40 square inches in area	Leaf	3.1% ad val.		8% ad val.
A	644.48	00	Leaves over 11.40 square inches in area	Sq. in.	40¢ for each 1,140 sq. in.	38.5¢ for each 1,140 sq. in.	82.5¢ for each 1,140 sq. in.
A	644.52	00	Mounted	Sq. in.	10.1% ad val.	5.2% ad val.	26% ad val.
A	644.56	00	Silver leaf	Leaf	2.5¢ per 100 leaves		5¢ per 100 leaves
A	644.60	00	Platinum leaf	Sq. in.	15.6% ad val.	8.2% ad val.	65% ad val.
			Base metal, in leaf:				
			Aluminum, in leaf:				
			Powder or flakes, in leaf:				
A	644.64	00	Leaves not over 30.25 square inches in area	Leaf	5.3% ad val.	2.7% ad val.	13.5% ad val.
A	644.68	00	Leaves over 30.25 square inches in area	Sq. in.	4.7% ad val.	3.8% ad val.	104% ad val.
			Other:				
A	644.72	00	Leaves not over 30.25 square inches in area	Leaf	1.4¢ per 100 leaves		6¢ per 100 leaves
A	644.76	00	Leaves over 30.25 square inches in area	Sq. in.	1.5¢ for each 3,025 sq. in.		6¢ for each 3,025 sq. in.

Note: For explanation of the symbol "A" or "A*" in the column entitled "GSP", see general headnote 3(c).

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SCHEDULES 8. - SPECIAL CLASSIFICATION PROVISIONS
Part 1. - Articles Exported and Returned

8 - 1 - B

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty	
				1	2
		Subpart B. - Articles Advanced or Improved Abroad			
		Subpart B headnotes:			
		1. This subpart shall not apply to any article exported —			
		(a) from continuous customs custody with remission, abatement, or refund of duty;			
		(b) with benefit of drawback;			
		(c) to comply with any law of the United States or regulation of any Federal agency requiring exportation; or			
		(d) after manufacture or production in the United States under item 864.05 of this schedule.			
		2. Articles repaired, altered, processed, or otherwise changed in condition abroad.—The following provisions apply only to items 806.20 and 806.30:			
		(a) The value of repairs, alterations, processing, or other change in condition outside the United States shall be —			
		(i) the cost to the importer of such change; or			
		(ii) if no charge is made, the value of such change,			
		as set out in the invoice and entry papers; except that, if the appraiser concludes that the amount so set out does not represent a reasonable cost or value, then the value of the change shall be determined in accordance with section 402 of this Act.			
		(b) No appraisement of the imported article in its changed condition shall be required unless necessary to a determination of the rate or rates of duty applicable to such article.			
		(c) The duty upon the value of the change in condition shall be at the rate which would apply to the article itself, as an entirety without constructive separation of its components, in its condition as imported if it were not within the purview of this subpart. If the article, as returned to the United States, is subject to a specific or compound rate of duty, such rate shall be converted to the ad valorem rate which when applied to the full value of such article determined in accordance with section 402 of this Act would provide the same amount of duties as the specific or compound rate. In order to compute the duties due, the ad valorem rate so obtained shall be applied to the value of the change in condition made outside the United States.			

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SCHEDULE 8. - SPECIAL CLASSIFICATION PROVISIONS
Part 1. - Articles Exported and Returned

8 - 1 - B

Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty	
				1	2
		3. Articles assembled abroad with components produced in the United States.—The following provisions apply only to item 807.00: (a) The value of the products of the United States assembled into the imported article shall be — (i) the cost of such products at the time of the last purchase; or (ii) if no charge is made, the value of such products at the time of the shipment for exportation, as set out in the invoice and entry papers; except that, if the appraiser concludes that the amount so set out does not represent a reasonable cost or value, then the value of such products shall be determined in accordance with section 402 of this Act. (b) The duty on the imported article shall be at the rate which would apply to the imported article itself, as an entirety without constructive separation of its components, in its condition as imported if it were not within the purview of this subpart. If the imported article is subject to a specific or compound rate of duty, the total duties shall be reduced in such proportion as the cost or value of such products of the United States bears to the full value of the imported article. 4. No imported article shall be accorded partial exemption from duty under more than one item in this subpart. Subpart B statistical headnotes: 1. For statistically reporting the articles provided for in this subpart the rate of duty for which is derived from a provision elsewhere in these schedules, the citation shall be the 7-digit number provided in this subpart followed by the reporting number of the provision from which such rate is derived. The unit of quantity reported hereunder for such articles shall be the same as the unit of quantity for the provision from which the rate was derived. For example, 10 new automotive compression-ignition engines exported for repairs or alterations and returned to the United States should be entered under item 806.2020 followed by 660.4220, with the quantity being shown as 10 and the value as dutiable value.			

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SCHEDULE 8. - SPECIAL CLASSIFICATION PROVISIONS
Part 1. - Articles Exported and Returned

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		2. For articles admitted under item 806.3000 or 807.0000 two values shall be reported--the first immediately following the first 7-digit number of the statistical citation (i.e., 806.3000 or 807.0000) and the second immediately following the reporting number of the provision in schedules 1-7 from which the rate of duty is derived, as follows: (a) For item 806.3000— (i) the total value of the article less the value of the foreign processing, and (ii) the dutiable value, i.e., the value of the foreign processing, respectively; and (b) For item 807.0000— (i) the value of the U.S. fabricated components, and (ii) the dutiable value, i.e., the total value of the articles less the value of the U.S. fabricated components, respectively.			
806.00	00	Photographic films and dry plates manufactured in the United States (except motion-picture films to be used for commercial purposes) and exposed abroad, whether developed or not	X.....	Free	Free
		Articles returned to the United States after having been exported to be advanced in value or improved in condition by any process of manufacture or other means:			
806.20	1/	Articles exported for repairs or alterations	1/	A duty upon the value of the repairs or alterations (see headnote 2 of this subpart)	A duty upon the value of the repairs or alterations (see headnote 2 of this subpart)
	20	Internal combustion engines...dutiable value..	1/		
	40	Other.....dutiable value..	1/		

1/ See subpart B statistical headnote 1.

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SCHEDULE 8. - SPECIAL CLASSIFICATION PROVISIONS
Part 1. - Articles Exported and Returned

8 - 1 - B
806.30 - 807.00

Item	Stat. Suf-fix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Articles returned to the United States after having been exported, etc. (con.):			
806.30	00 1/	Any article of metal (except precious metal) manufactured in the United States or subjected to a process of manufacture in the United States, if exported for further processing, and if the exported article as processed outside the United States, or the article which results from the processing outside the United States, is returned to the United States for further processing.....	1/ 2/	A duty upon the value of such processing outside the United States (see headnote 2 of this subpart)	A duty upon the value of such processing outside the United States (see headnote 2 of this subpart)
807.00	00 1/	Articles assembled abroad in whole or in part of fabricated components, the product of the United States, which (a) were exported in condition ready for assembly without further fabrication, (b) have not lost their physical identity in such articles by change in form, shape, or otherwise, and (c) have not been advanced in value or improved in condition abroad except by being assembled and except by operations incidental to the assembly process such as cleaning, lubricating, and painting.....	1/ 2/	A duty upon the full value of the imported article, less the cost or value of such products of the United States (see headnote 3 of this subpart)	A duty upon the full value of the imported article, less the cost or value of such products of the United States (see headnote 3 of this subpart)

1/ See subpart B statistical headnote 1.
2/ See subpart B statistical headnote 2.

Aluminum: Pre-MTN rate and staged rate modification, by TSUS items, 1980-87

TSUS Item No.	Pre-MTN col. 1 rate of duty 1/	Rates of duty 2/ effective with respect to articles entered on and after Jan. 1--							
		1980	1981	1982	1983	1984	1985	1986	1987
618.01	1.2¢/lb	3.1%	3.1%	3.0%	2.9%	2.8%	2.8%	2.7%	2.6%
618.02	1¢/lb	0.8¢/lb	0.7¢/lb	0.6¢/lb	0.5¢/lb	0.3¢/lb	0.2¢/lb	0.1¢/lb	Free.
618.04	1¢/lb	2.4%	2.4%	2.4%	2.3%	2.3%	2.2%	2.2%	2.1%
618.06	1¢/lb	0.8¢/lb	0.7¢/lb	0.6¢/lb	0.5¢/lb	0.3¢/lb	0.2¢/lb	0.1¢/lb	Free.
618.10	0.7¢/lb	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
618.15	2¢/lb	2.9%	2.9%	2.8%	2.8%	2.7%	2.7%	2.6%	2.6%
618.17	9.5%	8.9%	8.4%	7.8%	7.3%	6.7%	6.1%	5.6%	5.0%
618.20	6%	5.8%	5.6%	5.3%	5.1%	4.9%	4.7%	4.4%	4.2%
618.22	0.05/lb + 6%	5.9%	5.6%	5.4%	5.2%	4.9%	4.7%	4.4%	4.2%
618.25	2¢/lb	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
618.27	2¢/lb	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
618.29	12%	11.3%	10.6%	9.9%	9.3%	8.6%	7.9%	7.2%	6.5%
618.40	2.5¢/lb	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
618.42	9.5%	9.0%	8.6%	8.1%	7.6%	7.1%	6.7%	6.2%	5.7%
618.45	0.6¢/lb	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%	1.5%
618.47	9.5%	9.0%	8.6%	8.1%	7.6%	7.1%	6.7%	6.2%	5.7%
618.48	Free.	Free.	Free.	Free.	Free.	Free.	Free.	Free.	Free.
644.06	8.5%	8.1%	7.7%	7.3%	6.9%	6.5%	6.1%	5.7%	5.3%
644.08	8.8¢/lb	22.8%	20.9%	19.1%	17.2%	15.4%	13.5%	11.7%	9.8%
644.09	10%	9.5%	9.0%	8.4%	7.9%	7.4%	6.9%	6.3%	5.8%
644.11	4.6¢/lb	9.4%	8.9%	8.4%	7.9%	7.3%	6.8%	6.3%	5.8%
644.12	8.5%	8.1%	7.7%	7.3%	6.9%	6.5%	6.1%	5.7%	5.3%
644.26	9.5%	9.0%	8.6%	8.1%	7.6%	7.1%	6.7%	6.2%	5.7%
644.38	2¢/lb + 4%	4.8%	4.7%	4.5%	4.4%	4.2%	4.0%	3.9%	3.7%
644.42	1¢/lb + 4%	4.0%	3.5%	2.9%	2.3%	1.7%	1.2%	.6%	Free.
644.64	3¢/100 leaves + 5%	6.3%	5.8%	5.3%	4.8%	4.2%	3.7%	3.2%	2.7%
644.68	3¢/3,025 sq. in + 5%	5.0%	4.9%	4.7%	4.5%	4.3%	4.2%	4.0%	3.8%
644.72	1.5¢/100 leaves.	1.4¢/100 leaves.	1.4¢/100 leaves.	1.4¢/100 leaves.	1.4¢/100 leaves.	1.4¢/100 leaves.	1.4¢/100 leaves.	1.4¢/100 leaves.	1.4¢/100 leaves.

See footnotes at end of table.

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Aluminum: Pre-MTN rate and staged rate modification, by TSUS items, 1980-87--Continued

TSUS item No.	Pre-MTN col. 1 rate of duty 1/	Rates of duty 2/ effective with respect to articles entered on and after Jan. 1--							
		1980	1981	1982	1983	1984	1985	1986	1987
644.76	1.5¢/ 3,025 sq. in.	1.5¢/3,025 sq. in.	1.5¢/ 3,025 sq. in.	1.5¢/ 3,025 sq. in.	1.5¢/ 3,025 sq. in.	1.5¢/ 3,025 sq. in.	1.5¢/ 3,025 sq. in.	1.5¢/ 3,025 sq. in.	1.5¢/ 3,025 sq. in.

1/ Rate effective prior to Jan. 1, 1980.
2/ The symbol "%" indicates "percent ad valorem." The symbol "/" indicates "per stated unit of quantity."

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Appendix B

Concordance of TSUS Numbers, Schedule B Numbers, SIC Numbers, SITC Numbers, and CCCN Numbers

Aluminum: TSUS item numbers, Schedule B numbers, SIC numbers, SITC numbers, and CCCN numbers included in this commodity group

TSUS item No.	Schedule B No.	SIC No.	SITC No.	CCCN No.
618.01	618.0300	3334, 3341	684.1	76.01
	618.0670	3355		
618.02	618.0300	3334, 3341	684.1	76.01
		3355		
618.04	618.0630	3334, 3341	684.1	76.01
	618.0670	3355		
618.06	618.0630	3334, 3341	684.1	76.01
	618.0670	3355		
618.10	618.1020		689.99	76.01
	618.1040			
618.15	618.1520	3354	684.21	76.02
	618.1540	3355		76.08
618.17	618.1700	3354	684.21	76.02
		3355		76.08
618.20	618.2100	3355	684.21	76.02
		3357		
618.22	618.2100	3355	684.21	76.02
		3357		
618.25	618.2810	3353	684.21	76.02
	618.2830	3354	684.22	76.03
	618.2850	3355		76.08
	618.2870			
	618.2890			
618.27	618.2810	3353	684.21	76.02
	618.2830	3354	684.22	76.03
	618.2850	3355		76.08
	618.2870			
	618.2890			
618.29	618.2810	3353	684.21	76.02
	618.2830	3354	684.22	76.03
	618.2850	3355		76.08
	618.2870			
	618.2890			
618.40	618.4000	3399	684.24	76.05
618.42	618.4200	3399	684.24	76.05
618.45	618.4500	3334	684.25	76.06
		3341	684.26	76.07
618.47	618.4620	3353	684.25	76.06
	618.4640	3354	684.26	76.07
	618.4900			76.08
618.48	618.4620	3353	684.25	76.06
	618.4640	3354	684.26	76.07
	618.4900			76.08

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Aluminum: TSUS item numbers, Schedule B numbers, SIC numbers, SITC numbers, and CCCN numbers included in this commodity group--Continued

TSUS item No.	Schedule B No.	SIC No.	SITC No.	CCCN No.
644.06	644.0720	3353	684.23	76.04
644.08	644.0720	3353	684.23	76.04
644.09	644.0720	3353	684.23	76.04
644.11	644.0720	3353	684.23	76.04
644.12	644.0720	3353	684.23	76.04
644.26	644.0720	3353	684.23	76.04
644.38	644.0740	3353	684.23	76.04
644.42	644.0740	3353	684.23	76.04
644.64	644.4640	3399	684.24	76.05
644.68	644.4640	3399	684.24	76.05
644.72	644.4640	3399	684.24	76.05
644.76	644.4640	3399	684.24	76.05

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Appendix C

Statistical Tables

Table 1.—Unwrought aluminum and waste and scrap: U.S. production, exports of domestic merchandise, imports for consumption, and apparent consumption, 1977-81

(Quantity in thousands of pounds; value in thousands of dollars; unit value in dollars per pound)

Year	Production 1/	Exports	Imports	Apparent consumption	Ratio (percent) of imports to consumption
			Quantity		
1977	11,620,000	398,868	1,520,448	12,741,580	11.9
1978	12,254,000	642,250	1,699,881	13,311,631	12.8
1979	12,848,000	1,015,462	1,278,150	13,110,688	9.7
1980	13,038,000	2,319,176	1,280,931	11,999,755	10.7
1981	2/ 12,980,000	1,170,644	1,585,300	13,394,656	11.8
			Value		
1977	3/ 4,683,949	158,558	694,894	5,220,285	13.3
1978	3/ 5,191,064	275,239	813,830	5,729,655	14.2
1979	3/ 6,130,302	554,613	705,476	6,281,165	11.2
1980	3/ 7,346,410	1,590,537	837,358	6,593,431	12.7
1981	3/ 7,524,000	762,850	1,070,010	7,831,160	9.7
			Unit value		
1977	3/ $0.52	$0.40	$0.46	-	-
1978	3/ 0.54	0.43	0.48	-	-
1979	3/ 0.61	0.55	0.55	-	-
1980	3/ 0.72	0.69	0.65	-	-
1981	3/ 0.76	0.65	0.67	-	-

1/ U.S. Bureau of Mines, "Aluminum," 1980 Minerals Yearbook.
2/ Estimated.
3/ Excludes waste and scrap.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

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Table 2.--Wrought aluminum, including foil: U.S. shipments, exports of domestic merchandise, imports for consumption, and apparent consumption, 1977-81

(Quantity in thousands of pounds; value in thousands of dollars; unit value in dollars per pound)

Year	Shipments 1/	Exports	Imports	Apparent consumption	Ratio (percent) of imports to consumption
	Quantity				
1977	10,443,000	477,748	165,827	10,131,079	1.6
1978	11,346,000	452,871	485,974	11,379,103	4.3
1979	11,240,900	601,219	429,655	11,069,336	3.9
1980	10,598,000	766,824	170,143	10,001,319	1.7
1981	2/ 10,321,023	641,477	307,480	9,987,026	3.1
	Value				
1977	3/	375,157	125,769	3/	3/
1978	3/	408,583	371,733	3/	3/
1979	3/	617,596	389,120	3/	3/
1980	3/	885,050	197,263	3/	3/
1981	3/	745,064	357,429	3/	3/
	Unit value				
1977	-	$0.79	$0.76	-	-
1978	-	0.90	0.76	-	-
1979	-	1.03	0.91	-	-
1980	-	1.15	1.16	-	-
1981	-	1.16	1.16	-	-

1/ The Aluminum Association Inc., Aluminum Statistical Review.
2/ Estimated.
3/ Not available.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

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Table 3.--Unwrought aluminum and waste and scrap: U.S. imports for consumption, by principal sources, 1977-81

Source	1977	1978	1979	1980	1981
	Quantity (1,000 pounds)				
Canada	1,085,824	1,136,378	852,959	1,079,563	1,208,660
Ghana	211,274	176,322	219,639	170,144	188,421
Venez	1,119	22,338	27,951	965	32,500
Norway	24,960	110,723	88,112	4,379	29,388
Surinam	27,311	34,354	27,002	0	26,151
U King	33,521	34,741	15,325	5,328	32,651
Fr Germ	4,250	13,469	5,930	7,811	14,485
France	12,651	15,306	0	851	16,037
All other	119,537	156,249	41,233	11,891	37,006
Total	1,520,448	1,699,881	1,278,150	1,280,931	1,585,300
	Value (1,000 dollars)				
Canada	494,816	546,606	454,392	693,697	805,456
Ghana	104,078	98,173	134,844	118,733	144,459
Venez	275	9,623	14,764	318	21,677
Norway	12,009	43,691	52,811	4,327	19,477
Surinam	11,884	15,548	13,783	-	18,293
U King	15,050	16,913	9,512	3,671	18,175
Fr Germ	2,897	7,244	4,842	9,504	13,547
France	4,974	7,068	-	1,039	9,602
All other	48,911	68,965	20,527	6,269	19,322
Total	694,894	813,830	705,476	837,558	1,070,010
	Unit value (per pound)				
Canada	$0.46	$0.48	$0.53	$0.64	$0.67
Ghana	0.49	0.56	0.61	0.70	0.77
Venez	0.25	0.43	0.53	0.33	0.67
Norway	0.48	0.39	0.60	0.99	0.66
Surinam	0.44	0.45	0.51	-	0.70
U King	0.45	0.49	0.62	0.69	0.56
Fr Germ	0.68	0.54	0.82	1.22	0.94
France	0.39	0.46	-	1.22	0.60
All other	0.41	0.44	0.50	0.53	0.52
Average	0.46	0.48	0.55	0.65	0.67

Source: Compiled from official statistics of the U.S. Department of Commerce.

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Table 4.--Wrought aluminum, including foil: U.S. imports for consumption, by principal sources, 1977-81

Source	1977	1978	1979	1980	1981
	Quantity (1,000 pounds)				
Canada	19,234	34,701	37,420	44,331	51,405
Japan	21,511	126,265	94,674	20,957	45,035
Venez	3,598	9,133	24,198	8,246	25,533
France	11,700	47,758	32,922	10,262	21,663
Austral	44	1,776	13,882	24,525	34,290
Belgium	48,477	97,897	61,642	5,243	26,713
Fr Germ	7,849	40,186	18,196	7,936	12,032
Italy	7,353	20,802	19,693	5,793	13,706
All other	46,062	107,456	127,027	42,849	77,104
Total	165,827	485,974	429,655	170,143	307,480
	Value (1,000 dollars)				
Canada	16,035	29,451	34,885	41,450	56,062
Japan	15,647	94,984	86,367	21,070	46,835
Venez	1,736	4,859	14,277	6,591	45,923
France	11,139	39,413	38,519	19,776	31,386
Austral	30	1,270	11,097	20,942	29,526
Belgium	31,338	65,410	50,556	6,465	25,030
Fr Germ	9,899	39,947	22,968	17,230	21,715
Italy	5,814	16,776	22,281	9,992	17,438
All other	34,130	79,624	108,171	53,746	83,514
Total	125,769	371,733	389,120	197,263	357,429
	Unit value (per pound)				
Canada	$0.83	$0.85	$0.93	$0.94	$1.09
Japan	0.73	0.75	0.91	1.01	1.04
Venez	0.48	0.53	0.59	0.80	1.80
France	0.95	0.83	1.17	1.93	1.45
Austral	0.68	0.71	0.80	0.85	0.86
Belgium	0.65	0.67	0.82	1.23	0.94
Fr Germ	1.26	0.99	1.26	2.17	1.80
Italy	0.79	0.81	1.13	1.72	1.27
All other	0.74	0.74	0.85	1.25	1.08
Average	0.76	0.76	0.91	1.16	1.16

Source: Compiled from official statistics of the U.S. Department of Commerce.

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Table 5.--Unwrought aluminum and waste and scrap: U.S. exports of domestic merchandise, by principal markets, 1977-81

Market	1977	1978	1979	1980	1981
	Quantity (1,000 pounds)				
Japan	117,498	349,405	546,370	1,215,675	831,509
Mexico	19,218	50,636	73,373	134,558	99,264
Canada	78,702	57,473	70,873	73,574	63,610
Thailnd	266	2,568	2,731	13,101	17,908
China t	16,920	20,826	23,749	89,630	22,483
Kor Rep	6,209	21,382	29,161	91,250	14,713
Brazil	26,795	35,462	42,644	79,326	14,395
China M	11,047	0	0	18,867	8,600
All other	122,213	104,498	226,561	603,195	98,162
Total	398,868	642,250	1,015,462	2,319,176	1,170,644
	Value (1,000 dollars)				
Japan	42,823	145,879	297,031	824,305	520,137
Mexico	9,311	27,037	46,590	85,394	76,160
Canada	29,450	22,576	42,261	46,759	40,146
Thailnd	108	1,317	1,728	10,877	13,113
China t	4,853	6,238	9,647	53,967	12,796
Kor Rep	2,389	10,434	17,727	72,374	10,647
Brazil	10,370	13,603	18,634	54,663	10,159
China M	5,311	-	-	14,895	8,113
All other	53,943	48,155	120,995	427,302	71,578
Total	158,558	275,239	554,613	1,590,537	762,850
	Unit value (per pound)				
Japan	$0.36	$0.42	$0.54	$0.68	$0.63
Mexico	0.48	0.53	0.63	0.63	0.77
Canada	0.37	0.39	0.60	0.64	0.63
Thailnd	0.41	0.51	0.63	0.83	0.73
China t	0.29	0.30	0.41	0.60	0.57
Kor Rep	0.38	0.49	0.61	0.79	0.72
Brazil	0.39	0.38	0.44	0.69	0.71
China M	0.48	-	-	0.79	0.94
All other	0.44	0.46	0.53	0.71	0.73
Average	0.40	0.43	0.55	0.69	0.65

Source: Compiled from official statistics of the U.S. Department of Commerce.

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Table 6.--Wrought aluminum, including foil: U.S. exports of domestic merchandise, by principal markets, 1977-81

Market	1977	1978	1979	1980	1981
	Quantity (1,000 pounds)				
Canada	191,568	184,661	266,298	248,812	292,355
Mexico	34,488	50,253	62,477	77,496	108,813
Japan	4,657	9,838	19,104	41,377	38,339
Venez	16,262	18,214	23,244	43,920	34,558
U King	57,024	34,171	48,897	33,013	30,467
Italy	15,890	8,483	18,236	21,569	10,141
Fr Germ	16,695	12,911	16,268	25,076	10,866
Israel	3,902	6,137	6,720	6,847	10,117
All other	137,263	128,203	139,974	268,715	105,822
Total	477,748	452,871	601,219	766,824	641,477
	Value (1,000 dollars)				
Canada	132,576	152,896	244,334	264,215	274,574
Mexico	26,732	39,974	58,524	80,559	115,440
Japan	5,721	8,894	24,838	53,328	48,596
Venez	12,499	16,507	22,257	45,064	39,043
U King	44,111	31,564	48,759	45,387	37,339
Italy	13,686	11,471	25,905	35,679	23,739
Fr Germ	16,847	14,471	20,397	35,213	22,122
Israel	4,079	7,380	8,736	10,632	17,379
All other	118,905	125,427	163,846	314,971	166,832
Total	375,157	408,583	617,596	885,050	745,064
	Unit value (per pound)				
Canada	$0.69	$0.83	$0.92	$1.06	$0.94
Mexico	0.78	0.80	0.94	1.04	1.06
Japan	1.23	0.90	1.30	1.29	1.27
Venez	0.77	0.91	0.96	1.03	1.13
U King	0.77	0.92	1.00	1.37	1.23
Italy	0.86	1.35	1.42	1.65	2.34
Fr Germ	1.01	1.12	1.25	1.40	2.04
Israel	1.05	1.20	1.30	1.55	1.72
All other	0.87	0.98	1.17	1.17	1.58
Average	0.79	0.90	1.03	1.15	1.16

Source: Compiled from official statistics of the U.S. Department of Commerce.

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SUMMARIES OF TRADE AND TARIFF INFORMATION

USITC PUBLICATION 841

COMPLETE LIST OF SUMMARIES PUBLISHED TO DATE IN SCHEDULE 6

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6-5-3	May 1981	Electrical Capacitors and Resistors
6-4-4	May 1981	Metalworking Machine Tools
6-4-5	June 1981	Typewriters Not Incorporating a Calculating Mechanism
6-6-6	July 1981	Mototcycles
6-4-7	July 1981	Printing and Typesetting Machinery and Printing Plates
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6-1-15	Feb. 1982	Ores and Concentrates and Other Metal-Bearing Materials
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6-5-17	March 1982	Portable Electric Lamps and Bulbs